

ABSTRACT

A spectroscopy system is provided which operates in the vacuum ultraviolet spectrum. More particularly, a system utilizing reflectometry techniques in the vacuum ultraviolet spectrum is provided for use in metrology applications. To ensure accurate and repeatable measurement, the environment of the optical path is controlled to limit absorption effects of gases that may be present in the optical path. To account for absorption effects that may still occur, the length of the optical path is minimized. To further account for absorption effects, the reflectance data may be referenced to a relative standard. Referencing is particularly advantageous in the VUV reflectometer due to the low available photon flux and the sensitivity of recorded data to the composition of the gaseous medium contained with the optical path. Thus, errors that may be introduced by changes in the controlled environment may be reduced. In one exemplary embodiment, the VUV reflectometer may utilize a technique in which a beam splitter is utilized to create a sample beam and a reference beam to form the two arms of a near balanced Mach Zehnder interferometer. In another exemplary embodiment, the reference channel may be comprised of a Michelson interferometer.